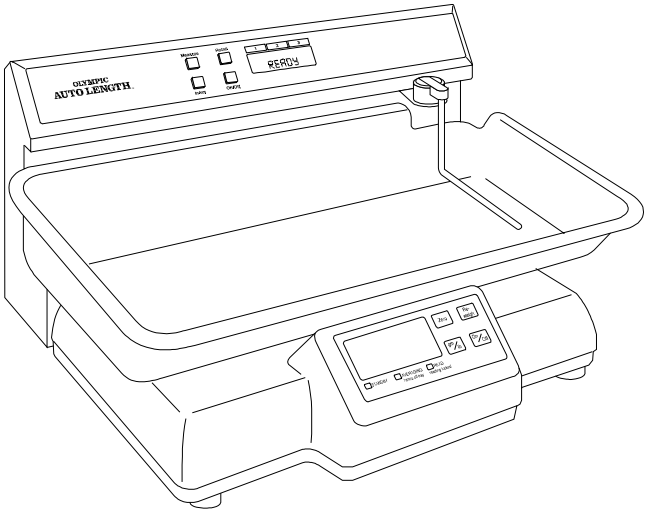
Instruction Manual

OLYMPIC AUTO-LENGTH™

120 Vac

CAUTION: Read and be familiar with this instruction manual before installing, operating, or servicing this product.



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Call 1-800-426-0353
in the U.S. or Canada

AL-5731A-EN(N01)

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Section 1: Installation

CAUTIONS:

- **Read and be familiar with this instruction manual before installing, operating, or servicing this device.**
- **This device should only be assembled and installed by a qualified technician.**
- **PC boards contain static-sensitive parts. Always use appropriate electro-static device (ESD) protection when the rear panel is open.**

WARNING: Electrical shock hazard when the enclosure is open. Always unplug the power cord from the electrical outlet before assembling, cleaning, or servicing.

Description & Use

The Olympic Auto-Length is an electronic device for measuring the length of babies (*Fig. 1A*).

Configurations

Olympic Medical offers five basic configurations of the Auto-Length, including tabletop model or cart mounted models and combinations with an Olympic Medical Smart Scale™, as follows:

- Auto-Length (catalog no. 57310)
- Auto-Length for attachment to a previously purchased Model 20 Smart Scale (catalog no. 57320)
- Auto-Length and Model 20 Smart Scale (catalog no. 57330)
- Auto-Length on Cart (catalog no. 57340)
- Auto-Length and Model 20 Smart Scale on Cart (catalog no. 57350)

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outside North America

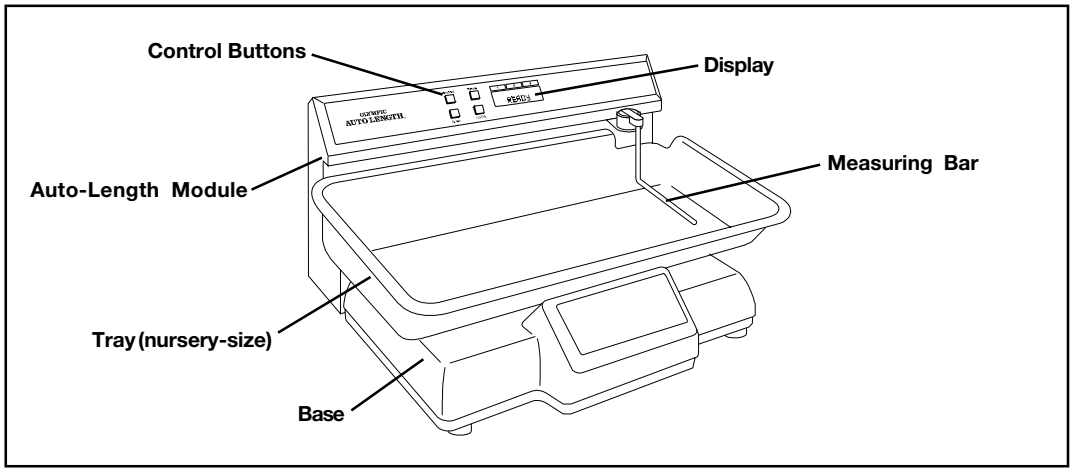


Fig. 1A

Assembly of Auto-Length (Without Scale)

To assemble the Auto-Length:

1. Unpack the Auto-Length from the shipping crate.
2. Install the tray on the base. The four tray attachment screws are accessible from the underside of the base (*Fig. 1B*). Screw each leg into the tray leg receptacle until fully seated.

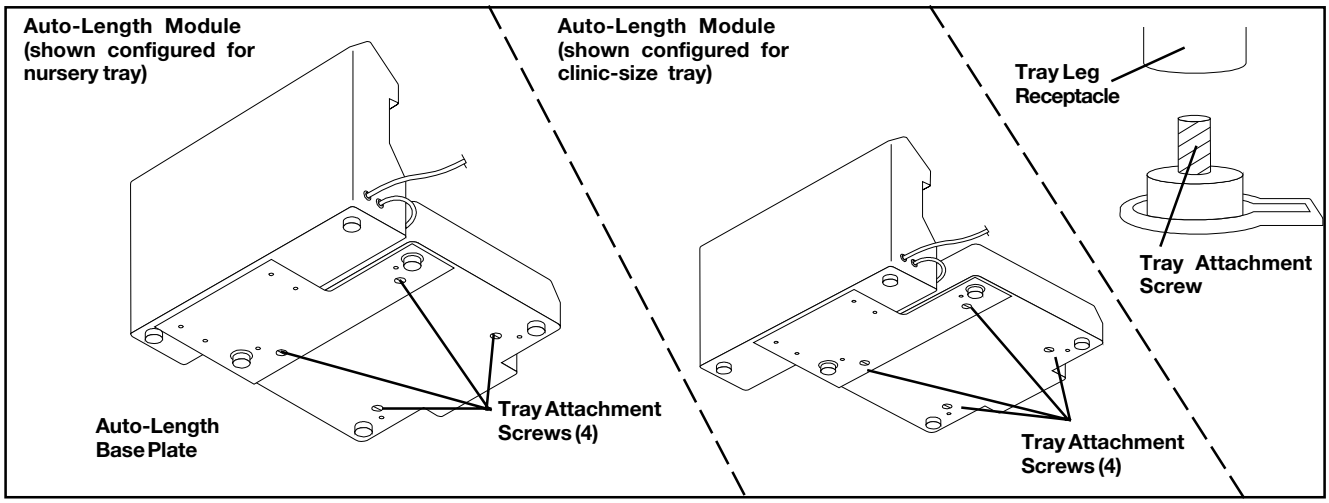

Auto-Length Module (shown configured for nursery tray)
Auto-Length Module (shown configured for clinic-size tray)
Tray Leg Receptacle
Tray Attachment Screw
Auto-Length Base Plate
Tray Attachment Screws (4)
Tray Attachment Screws (4)

Fig. 1B

3. Insert the measuring bar into the pivot assembly (*Fig. 1C*).

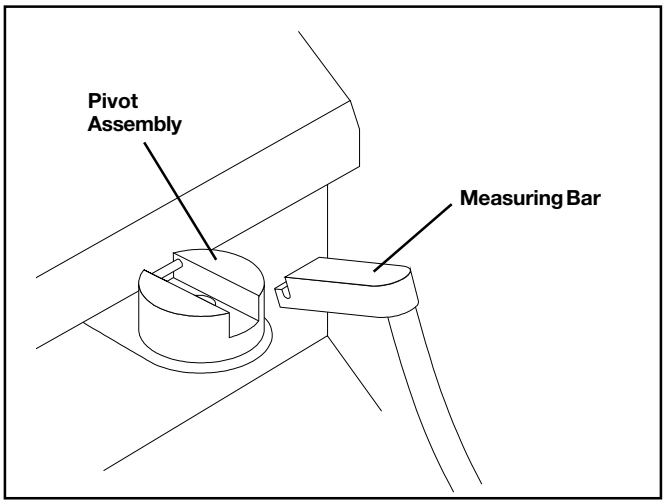


Fig. 1C

4. Connect the power cord to a hospital-grade electrical outlet.

   NOTE: When setting up the device for the first time, the NiCad battery pack may be fully discharged and may require charging before the device can be run on internal battery power (see *Replacing the Battery Pack* on page 3-1).

5. Calibrate and test the device before placing it into service (see *Calibration* on page 1-8).

Assembly of Combined Auto-Length/ Model 20 Smart Scale

To assemble the Auto-Length with the Model 20 Smart Scale:

1. Unpack the combined Auto-Length/Model 20 Smart Scale from shipping crate.
2. To install the tray: lower the tray so its four feet fit into the tray leg receptacles in the base, then securely tighten all four Phillips screws (*Fig. 1D*).

   CAUTION: Make sure all four tray legs are secured before placing infant in tray.

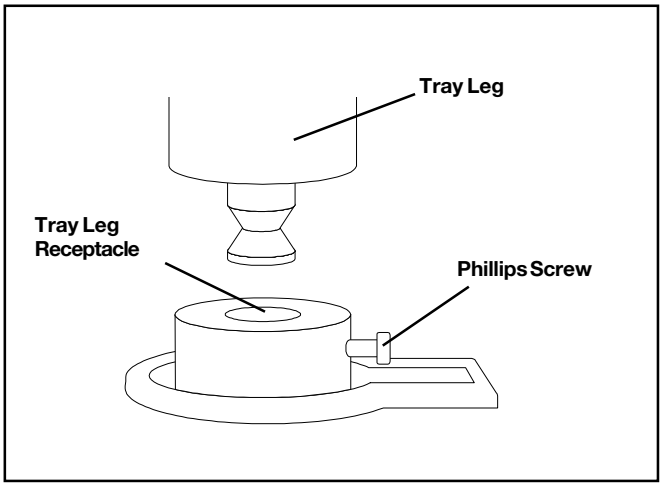


Fig. 1D

3. Insert the measuring bar into the pivot assembly (*Fig. 1C*).
4. Connect the power cord to a hospital-grade outlet.

   NOTE: When setting up the device for the first time, the NiCad battery pack may be fully discharged and may require charging before the device can be run on internal battery power (see *Replacing the Battery Pack* on page 3-1).

   NOTE: For charging requirements of the Smart Scale, refer to the Smart Scale Instruction Manual.

5. Calibrate and test the device before placing it into service (see *Calibration* on page 1-8).

NOTE: The Smart Scale must be calibrated after assembly or changing the tray; for details, refer to the Smart Scale Instruction Manual.

Changing the Tray Length

The Auto-Length must be reconfigured to change tray lengths.

To change from a nursery tray to a larger clinic tray:

NOTE: To change from a clinic tray to a nursery tray, reverse steps 8–10.

1. Unplug the power cord from the electrical outlet.
2. Remove the measuring bar from pivot assembly (*Fig. 1C*).
3. Remove the tray from the Auto-Length base or Model 20 scale (*Fig. 1E*).

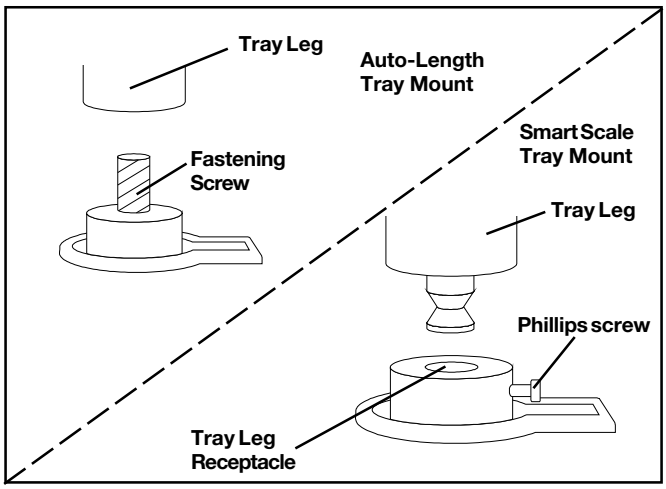


Fig. 1E

4. Remove the three screws from the rear panel, then lower the panel (*Fig. 1F*).

CAUTION: PC boards contain static-sensitive parts. Always use appropriate ESD protection when the rear panel is open.

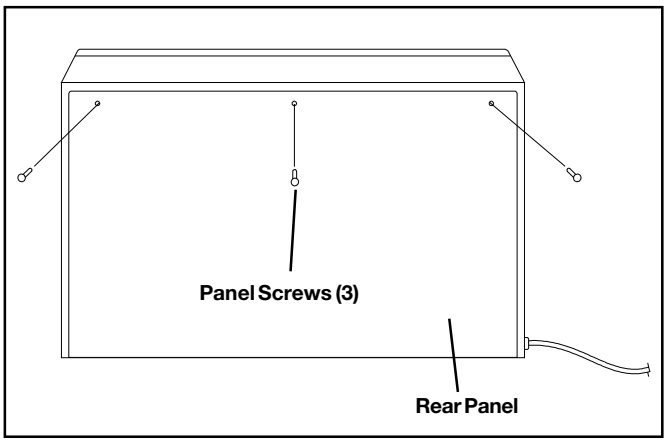


Fig. 1F

5. Remove the battery pack (*Fig. 1G*) from its Velcro® hold-down pad and set it aside.

NOTE: It is not necessary to unplug the battery pack.

6. Remove the two cover plates (*Figs. 1G* and *1H*).
7. Remove the four 8-32 screws that secure the Auto-Length module to the base plate (*Fig. 1H*).

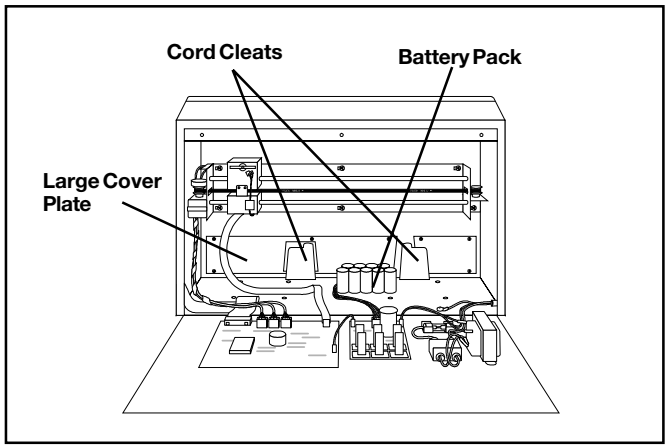


Fig. 1G

8. Slide the base to its extreme left position as shown in *Fig. 1I*.
9. Place and securely fasten the four 8-32 screws in the four alternate holes in the module (*Fig. 1I*).
10. Place the large cover plate (the small plate is not needed and should be stored in a safe place).

    CAUTION: To avoid electrical or mechanical damage, do not store the small plate inside the enclosure.

11. Place the battery pack into position on its Velcro® hold-down pad. Reconnect the battery as applicable.
12. Place and secure the rear panel of the enclosure (*Fig. 1F*).
13. Before using, calibrate the device (see *Calibration* on page 1-8).

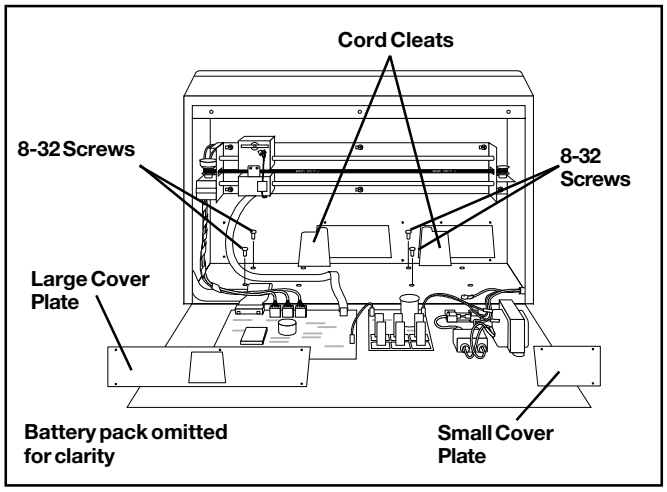


Fig. 1H

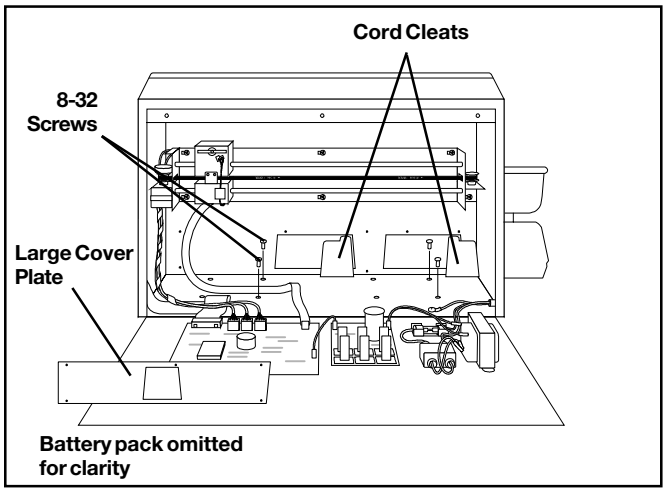


Fig. 1I

Instructions for Cart Mounting

CAUTIONS:

- **If the device is used on a cart, ensure that it is securely anchored to the cart before use.**
- **Do not use the cart to transport the infant.**
- ***Always lock the caster wheel brakes before placing the infant into the tray.***

It is possible to mount either an Auto-Length or a combined Auto-Length/Smart Scale on a cart by doing the following:

1. Unplug the power cord from the electrical outlet.
2. To mount Auto-Length only, remove tray by unscrewing four tray attachment screws (*Fig. 1J*). To mount the combined Auto-Length/Smart Scale, remove tray by loosening the four Phillips screws holding the tray legs (*Fig. 1K*).

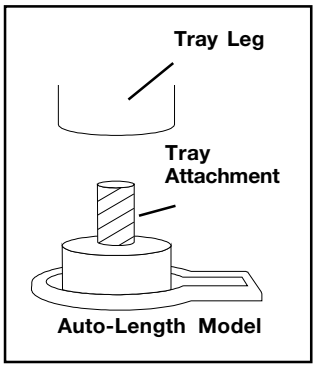


Fig. 1J

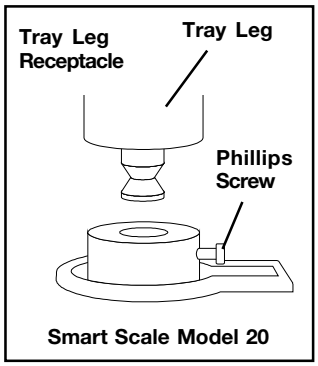


Fig. 1K

3. Remove the two screws holding the base plate to the Auto-Length base or Smart Scale.

   CAUTION: The base or Smart Scale is no longer attached to the Auto-Length. Handle with care.

4. Place the Auto-Length base or Smart Scale on the cart, aligning the base plate mounting holes (*Fig. 1L*) over the mounting holes on the cart.

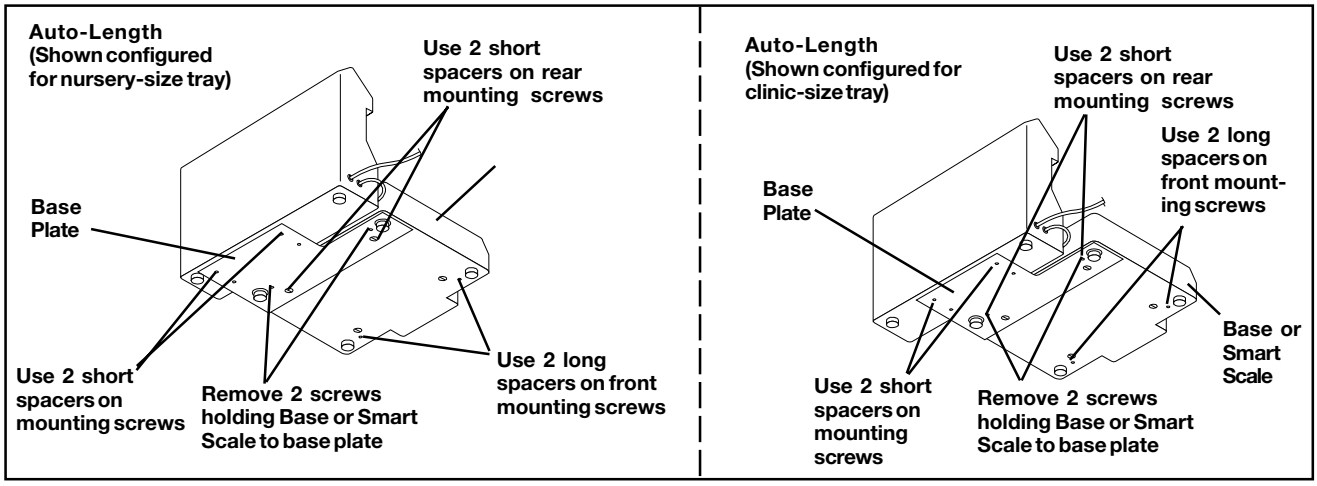

Auto-Length (Shown configured for nursery-size tray)
Use 2 short spacers on rear mounting screws
Base Plate
Use 2 short spacers on mounting screws
Remove 2 screws holding Base or Smart Scale to base plate
Use 2 long spacers on front mounting screws
Auto-Length (Shown configured for clinic-size tray)
Use 2 short spacers on rear mounting screws
Use 2 long spacers on front mounting screws
Base Plate
Base or Smart Scale
Use 2 short spacers on mounting screws
Remove 2 screws holding Base or Smart Scale to base plate

Fig. 1L

5. Carts supplied by Olympic Medical come with pre-drilled mounting holes. Use the supplied hardware to mount Auto-Length or combined Auto-Length/Smart Scale. Mounting hardware includes:

   - (4) 10-32 x 1.50” long Phillips plated steel screws
   - (4) #10 flat washers
   - (4) short plastic spacers
   - (2) long plastic spacers
   - (2) 8-32 x 1.50” Phillips pan-head screws
   - (2) #8 washers
   - (2) 8-32 KEP nuts

   Use two short spacers between the baseplate and the cart top on rear mounting screws (*Fig.1L*). Use the two long spacers between baseplate and cart top on front mounting screws (*Fig.1L*). Drive the 10-32 screws up through cart top, through spacers, and into tapped holes in the base plate under the Tray Module/Smart Scale 20. Securely tighten the screws.

6. Remove the rear panel of the Auto-Length. Remove the two 8-32 in. screws shown in *Fig. 1M*. Replace with the 8-32 mounting screws, using the washers from the device. Place remaining two short spacers under the Auto-Length and drive screws down through baseplate and spacers.

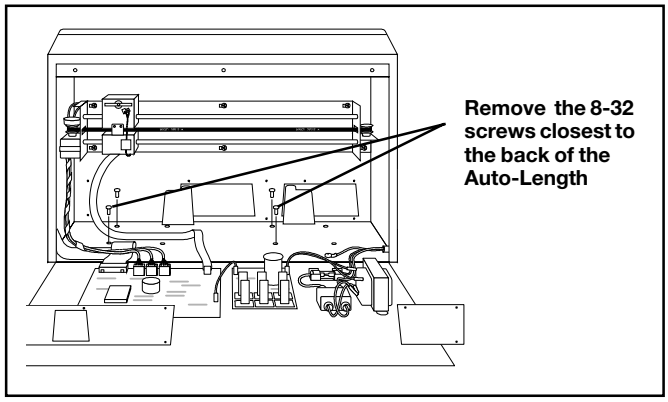


Fig. 1M

7. Attach the #8 washers and 8-32 KEP nuts on the inside of the cart.

8. Re-attach the tray.

   CAUTION: To avoid injury, ensure that all four tray legs are secure before placing an infant in the tray.

Calibration

Before placing the Auto-Length into service, calibrate and test it using an object of known length.

CAUTION: The Auto-Length must be calibrated each time the tray is changed and on a periodic basis to ensure accuracy.

NOTE: The Smart Scale must be calibrated after assembly or changing the tray; for details, refer to the Smart Scale Instruction Manual.

To calibrate the Auto-Length:

1. Press ON/OFF to turn on the device. “READY” shows on the display (*Fig 1N*).

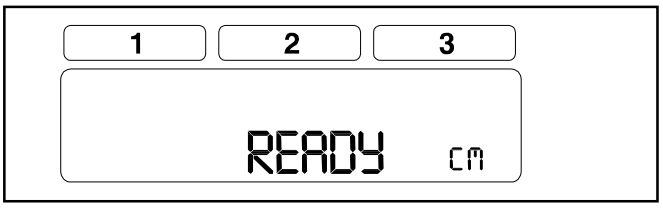


Fig. 1N

2. Press and hold RECALL, then press MEASURE. Release both switches. The software version number shows in the upper half of the display. Next, “CALIB” shows in the lower half of the display to show that the Auto-Length is in its calibration mode (*Fig. 1O*).

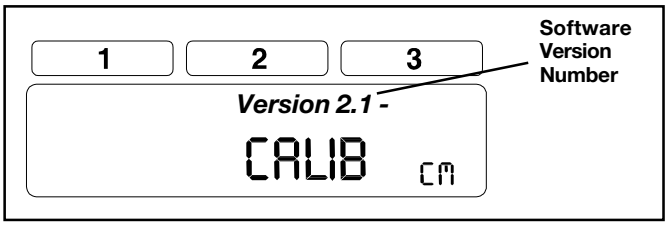


Fig. 1O

3. All trays have calibration marks. Behind the tray you will find a calibration tool held in place by a piece of Velcro®. Place the calibration tool precisely at the calibration mark, where the black arrow just touches the line (*Fig. 1P*).

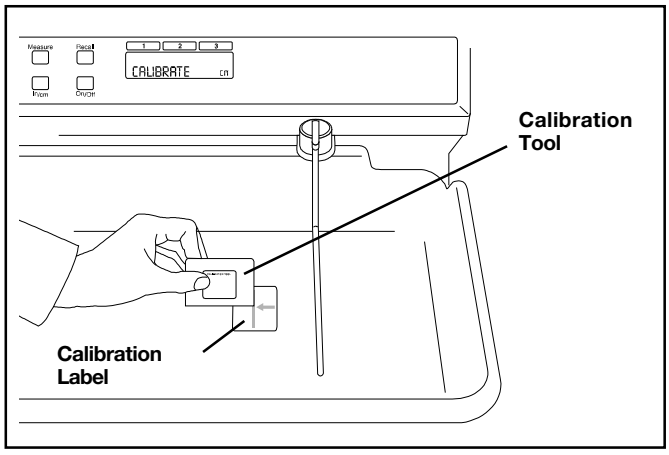


Fig. 1P

4. Press MEASURE to start the calibration procedure. The measuring bar moves to the calibration tool, touches it, then returns to its rest position. The measurement reading appears on the display (*Fig. 1Q*).

   NOTE: With either length tray, the reading should be 20.0 in. (50.8 cm).

   The Auto-Length stores the information in its memory. The "READY" appears in the lower half of the display, indicating that the Auto-Length is calibrated and is ready to measure.

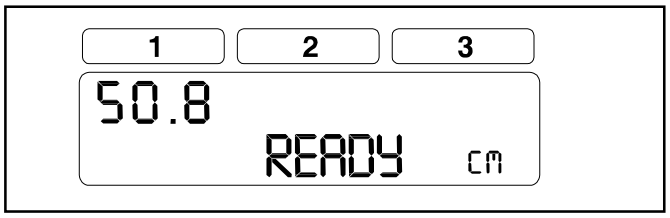


Fig. 1Q

5. Remove the calibration tool from the tray, then place the Velcro® holding pad.

   NOTES:

   - The Auto-Length automatically turns off after one minute of inactivity. The new calibration remains in the Auto-Length's memory when the device is turned off; it can be recalled when turned on again.
   - If an error occurred during the calibration procedure (e.g., the measuring bar touching something other than the calibration tool), repeat the calibration procedure.
   - If you change trays, it will be necessary to repeat the above procedure to calibrate the Auto-Length for the new tray length.

Canceling Calibration Mode

If the Auto-Length is inadvertently placed in calibration mode, cancel the mode by pressing OFF at any time **before** taking the calibration measurement.

Testing for Correct Operation

Before placing the Auto-Length in service, tested it as follows:

1. Place an object in the tray so that it is touching the end of the tray furthest from the measuring bar.
2. Press MEASURE.
3. After a two second delay, the Auto-Length will take three measurements. The measurements should all be within ±1 mm.
4. If the measurements are not within ±1 mm, recalibrate the Auto-Length and remeasure. If the measurements are beyond specifications, see *Troubleshooting* on page 3-18.

Electrical Requirements

CAUTION: This device must be connected directly to a hospital-grade electrical outlet.

The Auto-Length is rated at 120 Vac, 60 Hz, 0.4 amperes, and must be connected to a hospital-grade electrical outlet.

Battery Operation

The device can be powered by an internal rechargable battery pack consisting of nine sub-c NiCad batteries rated at 10.8 Volts (1.2 Volts per cell).

For information on charging and replacing batteries, see *Replacing the Battery Pack* on page 3-1.

Section 2: Operation

Caution Summary

CAUTION: Read and be familiar with this instruction manual before installing, operating, or servicing this device.

DANGER: Potential explosion hazard; do not use in the presence of flammable anesthetics.

CAUTION: This device must be connected directly to a hospital-grade electrical outlet.

CAUTION: To avoid injury, do not use this device to transport an infant and never leave the infant unattended in the tray.

CAUTION: If used on a cart, the Auto-Length must be securely bolted to the cart using the mounting holes at the bottom of the chassis.

CAUTION: To avoid injury, ensure that all four tray legs are secure before placing an infant in the tray.

Intended Use

The Olympic Auto-Length is a device for measuring the length of infants.

For information or assistance
call 1-800-426-0353
in the U.S. or Canada
or 1-206-767-3500
outside North America

Measuring the Infant

CAUTION: For accurate measurement, ensure that all objects (e.g., clothing, blankets) are either removed or will not be contacted by the Measuring Bar during the measurement cycle.

See *The Measurement Cycle,* on the opposite page, for an illustrated summary of steps.

To measure the infant:

1. Place the infant in the tray with the crown of his head just touching the left side of the tray (*Fig. 2F*).

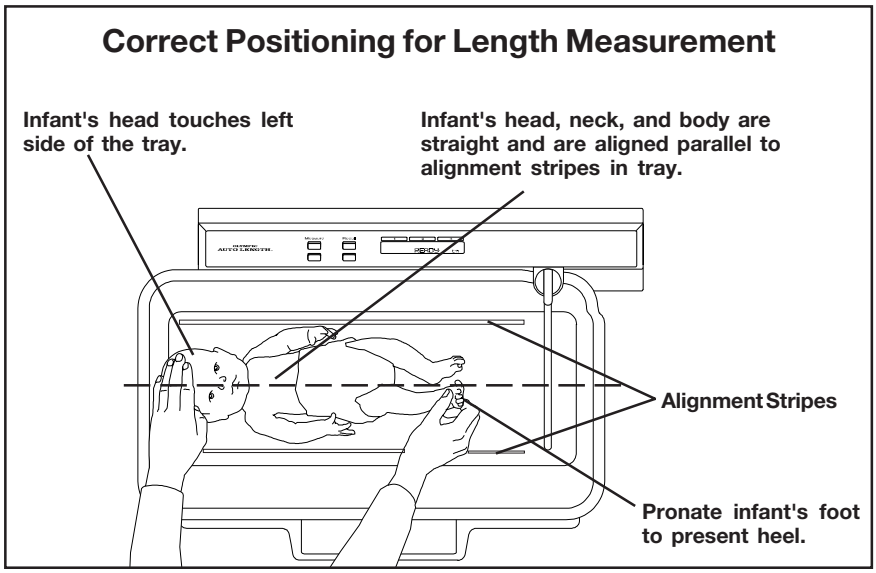

Correct Positioning for Length Measurement
Infant's head touches left side of the tray.
Infant's head, neck, and body are straight and are aligned parallel to alignment stripes in tray.
Alignment Stripes
Pronate infant's foot to present heel.

Fig. 2F

2. Press ON/OFF to turn the Auto-Length ON. “READY” shows on the lower half of the display (*Fig. 2A*).
3. Ensure that the infant’s neck and body are straight and are aligned parallel to the alignment stripes in the tray (*Fig. 2F*). Then, keeping one hand on the baby, press and release MEASURE. Return your hand to the baby and straighten the infant’s legs, pronating one foot to expose the heel. After a two-second delay, the Auto-Length will begin measuring.
4. The Measuring Bar will move toward the infant’s heel. When the Bar contacts the baby’s heel, the Auto-Length sounds an audible ‘beep’ and records the measurement (*Fig. 2B*).

   The Measuring Bar then retracts two-and-a-half inches (*Fig. 2C*)., moves forward again, touching the infant’s heel a second time, and records the second measurement. This cycle repeated for a total of three measurements (*Fig. 2D*). Keep the infant’s leg in position until the measurement cycle is complete and “READY” appears on the display.
5. After the final measurement, the Measuring Bar returns to the start position, and the infant may be removed from the measuring tray. All three measurements show on the display (*Fig. 2E*).

NOTE: The device automatically turns off after one minute of inactivity. You can recover the measurements from memory by turning on the Auto-Length, and then pressing RECALL before taking new measurements.

The Measurement Cycle

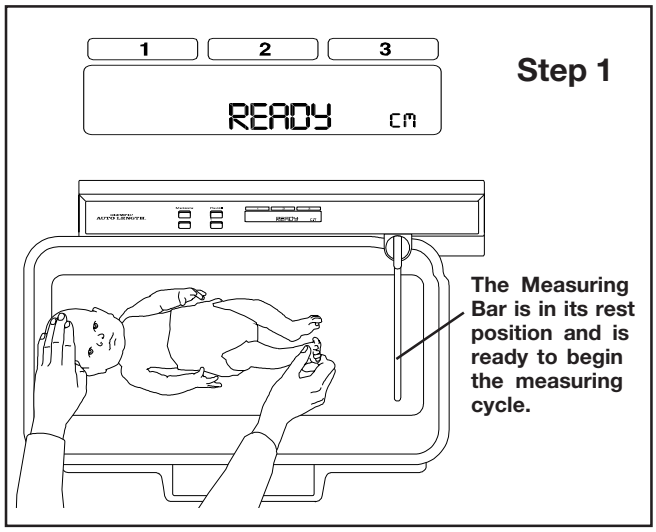


Fig. 2A

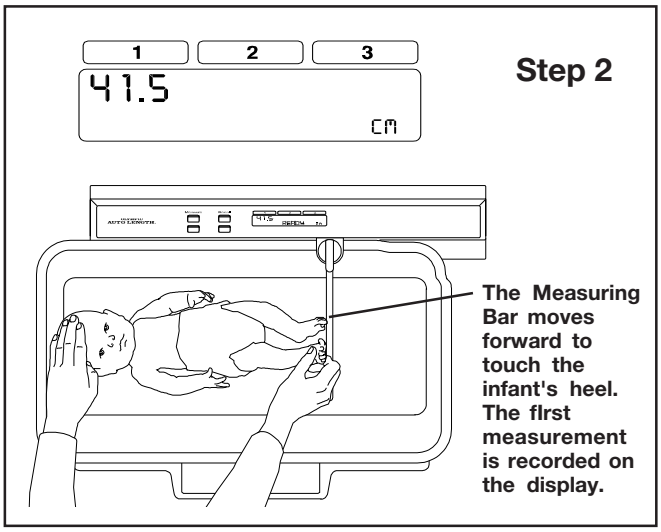


Fig. 2B

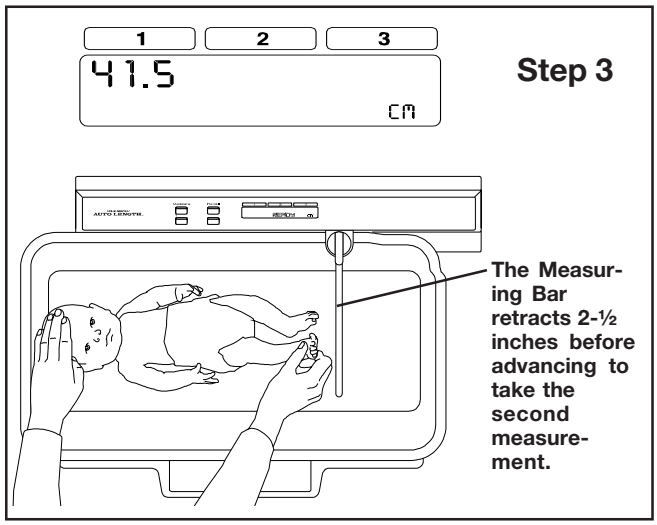


Fig. 2C

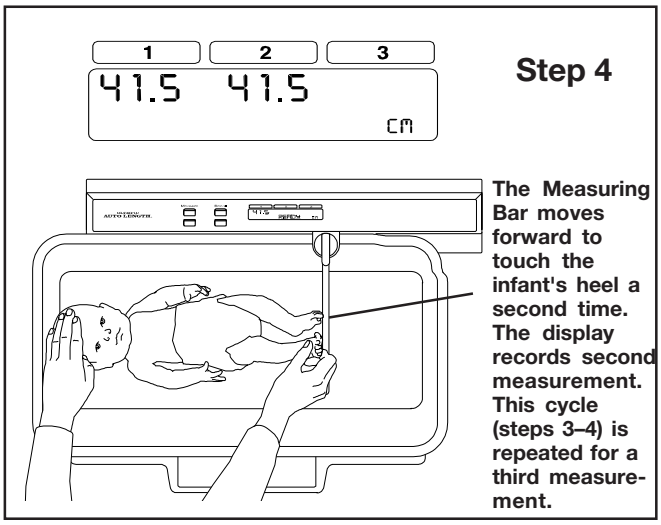

1
2
3
41.5 41.5
CM
Step 4
The Measuring Bar moves forward to touch the infant's heel a second time. The display records second measurement. This cycle (steps 3–4) is repeated for a third measurement.

Fig. 2D

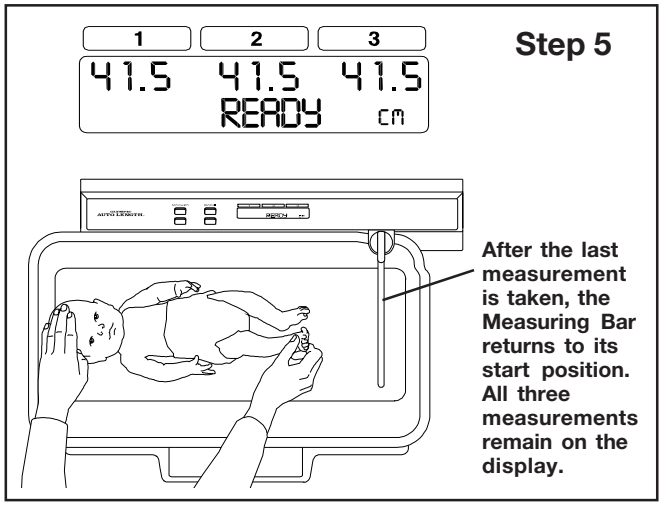


Fig. 2E

Controls and Signals

On/Off

Press ON/OFF to turn the power on or off (*Fig. 2G*). If the Auto-Length has begun the measurement cycle when the device is turned off, the measuring bar remains where it stopped. When the Auto-Length is turned on again, the measuring bar returns to its rest position and “READY” appears on the display.

Measure

Press MEASURE to start a measurement cycle (*Fig. 2G*). During the measurement cycle, three measurements are taken in rapid sequence. After the last measurement has been taken, “READY” appears in the lower half of the display signifying that the Auto-Length is ready to take another measurement.

NOTE: The Auto-Length automatically turns off after one minute of inactivity.

Recall

Press ON/OFF to turn on the device (*Fig. 2G*), then press RECALL to display the last measurements taken.

NOTE: The Auto-Length has a non-volatile memory. Information shown on the display is automatically stored in the Auto-Length’s memory and will not be lost when the device is turned off. Only the previous weighing can be recalled.

in/cm

Press IN/CM to toggle the unit of measurement between inches and centimeters (*Fig. 2G*). The bottom right corner of the display changes from “in’ to “cm” to show which units are active.

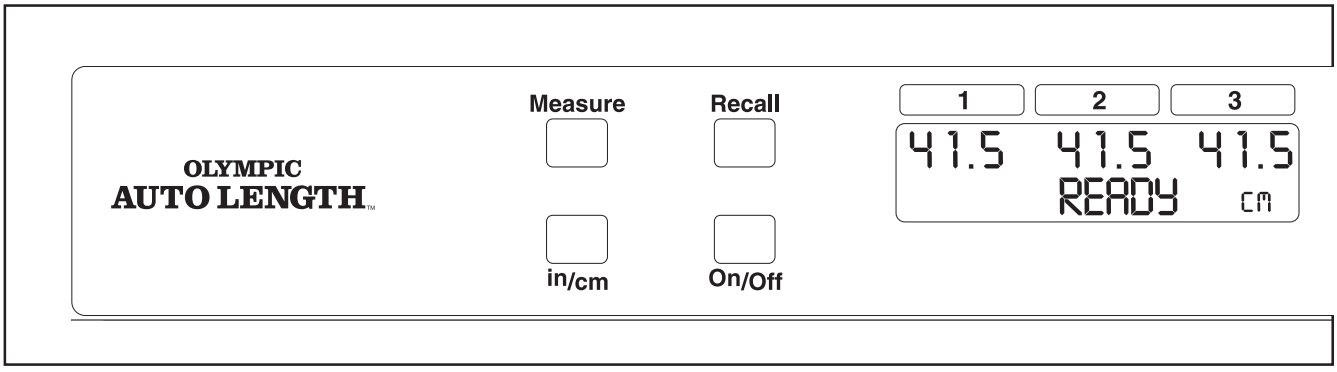


Fig. 2G

Display

The Auto-Length's display provides three measurement readings in the upper half of the display screen (*Fig. 2H*). Messages appearing in the lower half of the display screen show the Auto-Length's status, and prompt the operator. Common prompts include:

- **READY:** Indicates that power is on and the Auto-Length is ready to measure.
- **RECALL:** Appears below the last measurements recalled from memory.
- **CALIB:** Indicates that the Auto-Length is in its calibration mode.
- **LOW BATTERY:** Indicates the Auto-Length's batteries are depleted and should be recharged (see also *Replacing the Battery Pack* on page 3-1). Measurements cannot be made while the "Low Battery" message appears.
- **ERROR:** Appears when the measuring bar jams against an immovable obstacle and the motor stalls.
- **BAR JAMMED:** Appears if the measuring bar is pushed past the rest position.
- **RECALIBRATE:** Appears in the upper half of the display if the device requires calibration. "RECALIBRATE" shows until the Auto-Length is placed into calibration mode, and the device will not measure until it has been calibrated (see *Calibration* on page 1-8).

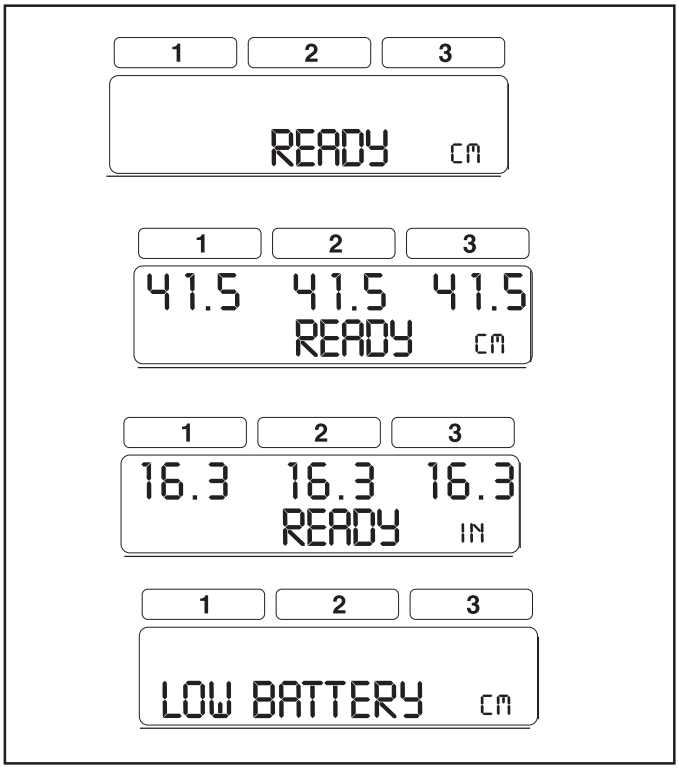


Fig. 2H

Cleaning the Auto-Length

CAUTION: To avoid electrical damage, do not allow liquids to enter the enclosure.

To clean the Auto-Length:

- Wipe all external surfaces using a mild soap-and-water solution or a liquid disinfectant.

  CAUTION: Do not use alcohol to clean tray or measuring bar, as this will damage the plastic.

- The measuring bar lifts up and out of the pivot assembly. Wipe measuring bar with a mild soap-and-water solution or a liquid disinfectant.

Section 3: Service

CAUTION: Only qualified technicians should perform service tasks.

CAUTION: Read and be familiar with this instruction manual before installing, operating, or servicing this device.

CAUTION: PC boards contain static-sensitive parts. Always use appropriate ESD protection when the rear panel is open.

WARNING: Electrical shock hazard when enclosure is open. Always unplug the power cord from the electrical outlet before cleaning or servicing.

Replacing the Battery Pack

The internal NiCad batteries can be recharged (after full discharge) approximately 500 times before requiring replacement.

Required parts:

- Battery pack, 10.8 Vac, 1200 mAh (catalog no. 57394)
- Screwdriver

To replace the battery pack:

WARNING: Electrical shock hazard when enclosure is open. Always unplug the power cord from the electrical outlet before cleaning or servicing.

1. Remove the three screws that secure the rear panel, then lower the panel (*Fig. 3A*).

CAUTION: PC boards contain static-sensitive parts. Always use appropriate ESD protection when the rear panel is open.

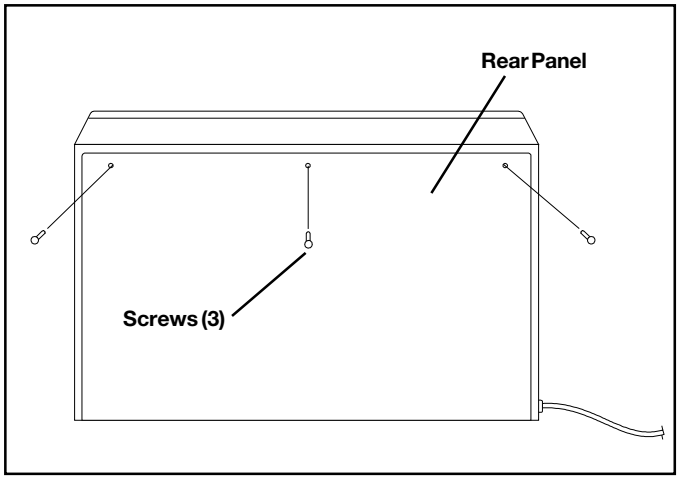


Fig. 3A

For information or assistance
call 1-800-426-0353
in the U.S. or Canada
or 1-206-767-3500
outside North America

2. Unplug the battery lead from the PCB (*Fig. 3B*), then lift the battery pack from its Velcro® hold-down pad.

NOTES:

- For shipping purposes, the battery pack is held down by a nylon tie. If this has not yet been removed, cut the nylon tie with scissors and discard.
- Charge new batteries for 1–2 hours before operating on battery power. To charge, install the battery, then simply connect power cord to an appropriate electrical outlet.

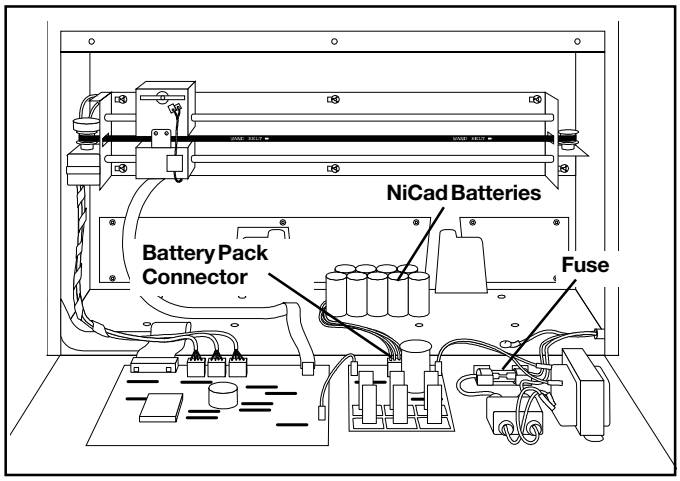


Fig. 3B

Replacing the Fuse

The Auto-Length's internal electronics are protected by a fuse.

Required parts:

■ Fuse, 0.38 amp, Slo-Blo (catalog no. 200021-569)

To replace the fuse:

1. Remove the fuse from its fuse holder.
2. Place the new fuse into position (*Fig. 3B*).

Replacing the Belt

To replace the belt:

1. Remove the three screws at the top of the rear panel (*Fig. 3A*), then lower the panel.

   CAUTION: PC boards contain static-sensitive parts. Always use appropriate ESD protection when the rear panel is open.

2. Manually move carriage until it is at the midpoint of its travel.

3. Grasp the belt at both sides of belt lock on the carriage assembly and pull down (*Fig. 3C*).

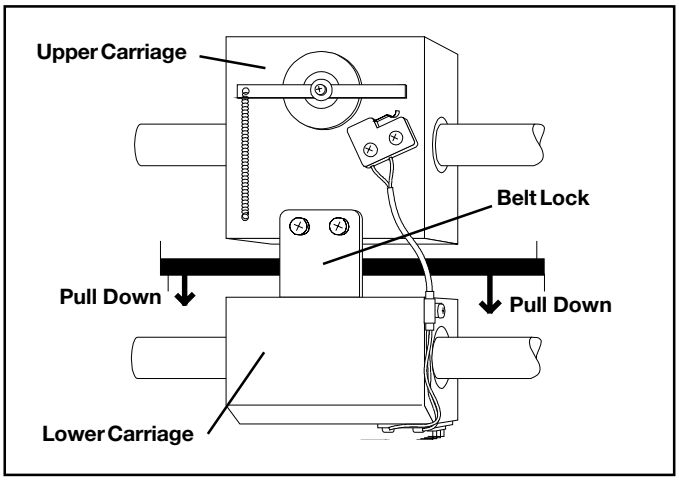


Fig. 3C

4. Loosen the idler pulley shaft screw at right side of the chassis, then slide the shaft and pulley to the left (*Fig. 3D*).

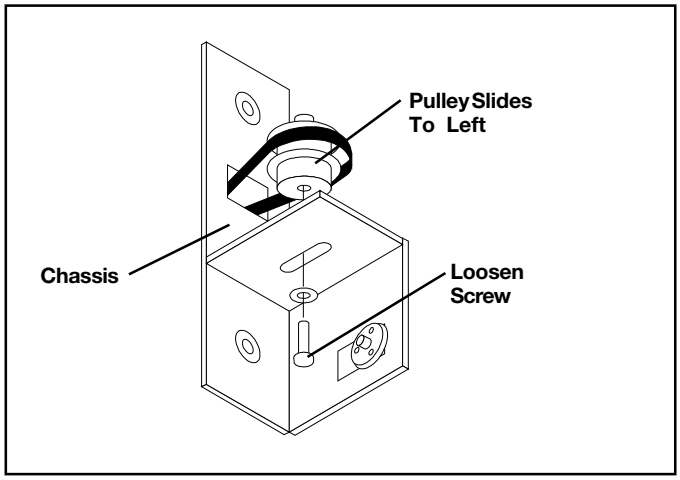


Fig. 3D

5. Remove the belt from both pulleys.

6. Thread the new belt between carriage plate and belt lock on carriage. Thread the belt ends through the chassis cutouts, then place them over the pulleys.

7. Slide the idler pulley and shaft to the right to moderately tighten belt, then tighten the shaft screw.
8. Align the belt notch with the carriage belt lock tang, then slide the belt upwards to engage the belt lock.
9. Slide the carriage to extreme left.
10. Adjust the belt tension as required by moving the idler pulley shaft. The belt tension is correct when a 6 oz. (± 0.5 oz.) force applied at the midpoint of the belt deflects the belt so that it just touches the front portion of the belt.
11. Place an object in the tray. Turn on the device and start a measurement cycle. If the cycle does not complete, the display will show "ERROR" and the optical encoder must be adjusted (see *Adjusting the Optical Encoder* on page 3-7).

Removing the Chassis

Required parts:

- Allen wrench

To remove the chassis:

1. Remove the three screws from the top of the rear panel (*Fig. 3A*), then lower the panel.

   CAUTION: PC boards contain static-sensitive parts. Always use appropriate ESD protection when the rear panel is open.

2. Access the pivot assembly set screw from the inside housing or, alternately, remove top cap according to the procedure in *Replacing the Display PCB* on page 3-16.
3. Loosen the set screw that secures the pivot assembly to the pivot shaft (*Fig. 3E*); back off the set screw approximately 1/8".

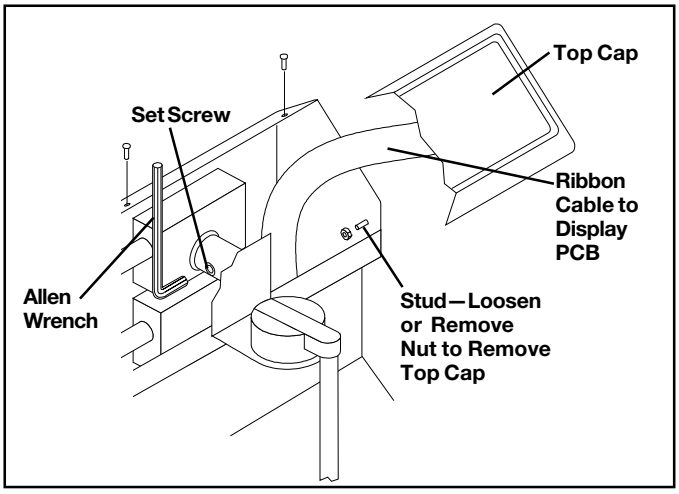


Fig. 3E

4. Disconnect the carriage ribbon cable (*Fig. 3F*).

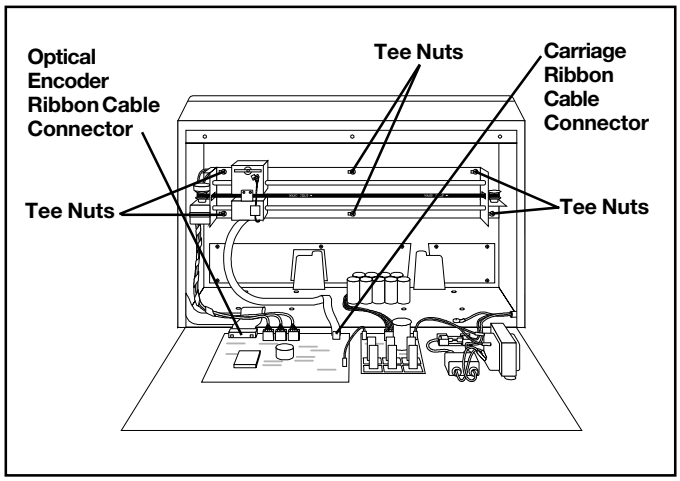


Fig. 3F

5. Disconnect the optical encoder ribbon cable (*Fig. 3F*).
6. Unscrew the flanged tee nuts (8) that secure the chassis to the housing. Use a small diameter tool that fits the hole size in the tee-nut flanges.
7. Pull the chassis out of the enclosure. It may be necessary to hold the pivot assembly while removing the chassis from the enclosure.
8. To reassemble, reverse steps 1–6.

   NOTE: Do not overtighten the tee nuts. Ensure that the home position switch wire (*Fig. 3N*) is routed away from pulley and weight.

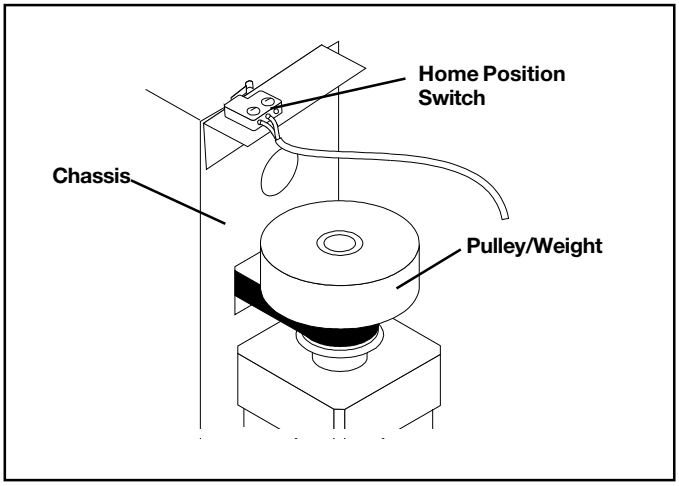


Fig. 3N

Replacing Optical Encoder Wheel and Optical Encoder Sensor

To replace the optical encoder wheel and sensor:

1. Remove the chassis assembly (see *Removing the Chassis* on page 3-4).
2. Remove the screws that secure the optical encoder circuit board to the chassis (*Fig. 3G*), then slide the optical encoder out sideways as shown in *Fig. 3G*.

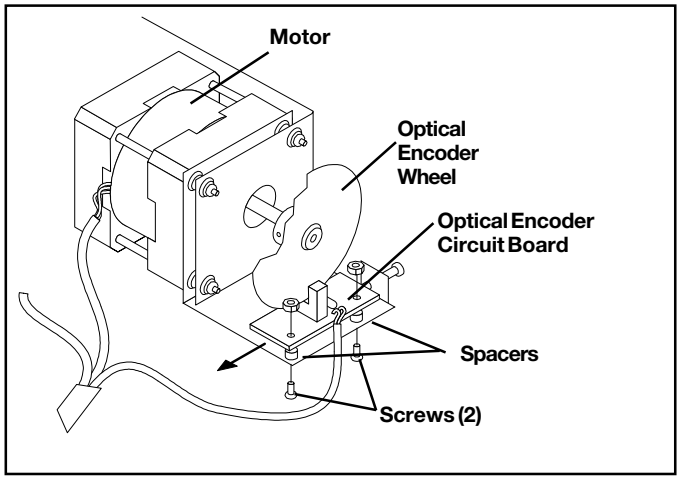


Fig. 3G

3. Loosen the set screw that secures the encoder wheel to the motor shaft, then pull the encoder wheel straight off of the shaft (*Fig. 3H*).

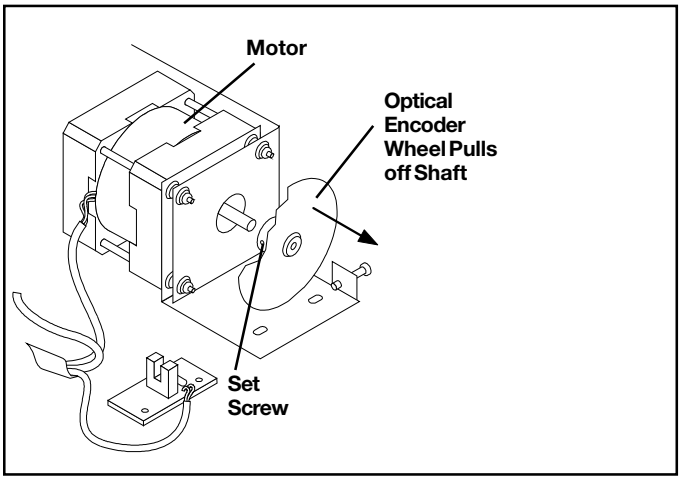


Fig. 3-8

4. Replace all faulty components, then tighten the optical sensor circuit board fasteners snugly, but loose enough to allow side-to-side movement by the adjusting screw. Tighten the encoder wheel.
5. Reinstall the chassis in the housing, then test for correct operation.

Adjusting the Optical Encoder

To adjust the optical encoder:

1. Turn the adjusting screw counterclockwise until the sensor can be moved just to the right of the centerline of the wheel (*Fig. 31*).

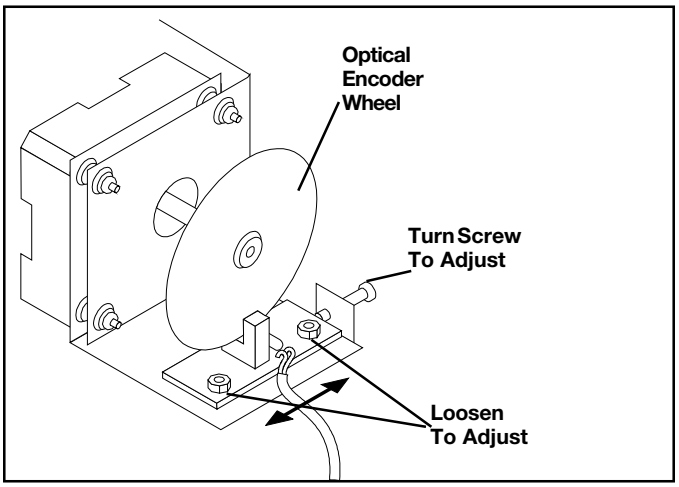


Fig. 31

2. Initiate a measuring cycle.
3. If the cycle **does not** complete three readings and return to home without showing "ERROR" on the display, turn the adjusting screw 1/8 turn clockwise and try again (*Fig. 31*).
4. Repeat the 1/8 turn at a time until cycle completes without showing "ERROR."
5. Tighten the sensor board fasteners, then perform the test cycle again. Repeat until the cycle completes with tightened sensor screws.

   NOTE: It should not be necessary to turn screw more than two full turns.

Replacing the Motor

To replace the motor:

1. Remove the chassis (see *Removing the Chassis* on page 3-4).

   CAUTION: PC boards contain static-sensitive parts. Always use appropriate ESD protection when the rear panel is open.

2. Remove the optical sensor and encoder wheel as described in *Replacing the Optical Sensor* on page 3-6.

3. Loosen the belt tension by loosening the idler pulley shaft screw.

4. Remove the lock nuts that secure the motor assembly to the chassis (*Fig. 3J*).

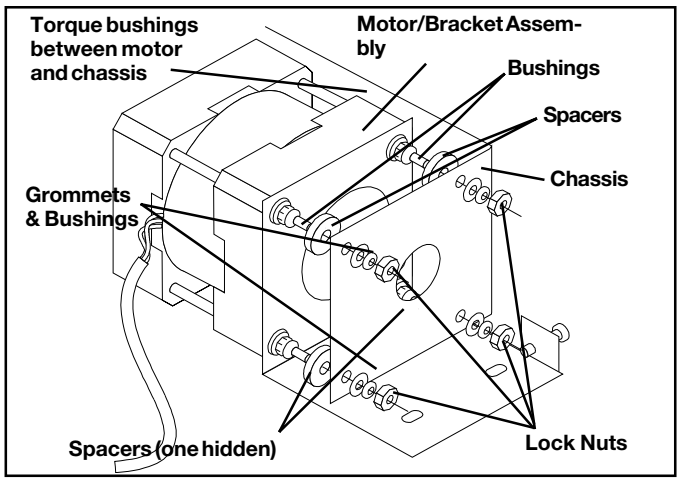


Fig. 3J

5. Remove the motor/bracket assembly. Keep the thrust bushing if it separates from the chassis. Set the spacers aside (*Fig. 3J*)

6. Loosen the set screw that secures the pulley/weight to the motor shaft, then pull off the shaft (*Fig. 3K*).

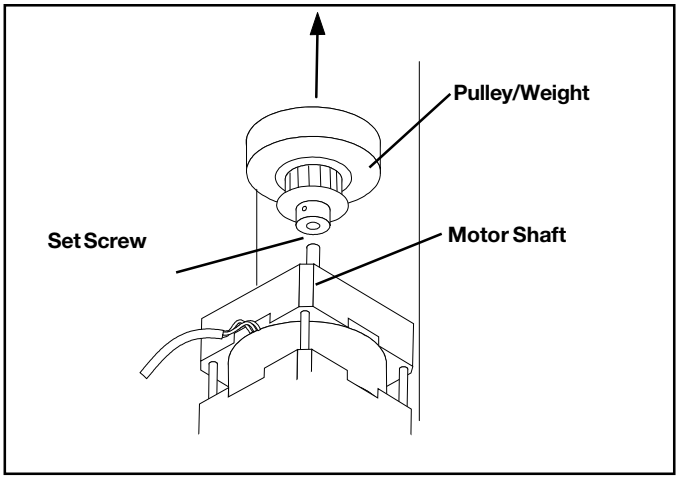


Fig. 3K

7. Install the pulley/weight on shaft of the new motor/bracket assembly (catalog no. 400710-K01) and tighten the set screw.
8. Place the thrust bushing and spacers between the motor assembly and chassis, then install the new motor assembly.
9. Install the lock nuts and washers. Tighten the lock nuts until the washers just touch the chassis bushings.
10. Tighten the belt per the instructions in *Replacing the Belt* on page 3-3. If this causes the right-side washers to be clear of the bushings, tighten the lock nuts until they just touch.
11. Install the Optical Sensor and Encoder Wheel (see page 3-6).
12. Test for proper operation per the instructions in *Replacing the Belt* on page 3-3.
13. Replace the chassis assembly into housing per the instructions in *Replacing the Belt* on page 3-3.

Replacing the Motor Pulley

To replace the motor pulley:

1. Remove the belt (see *Replacing the Belt* on page 3-3).
2. Loosen the set screw that secures the pulley/weight to the motor shaft (*Fig. 3K*).
3. Replace with the new pulley/weight assembly.
4. Replace the belt.
5. Set the belt tension as described in *Replacing the Belt* on page 3-3.

Replacing the Idler Pulley

To replace the idler pulley:

1. Remove the belt (see *Replacing the Belt* on page 3-3).
2. Remove the retaining ring from the top of the shaft (*Fig. 3L*).

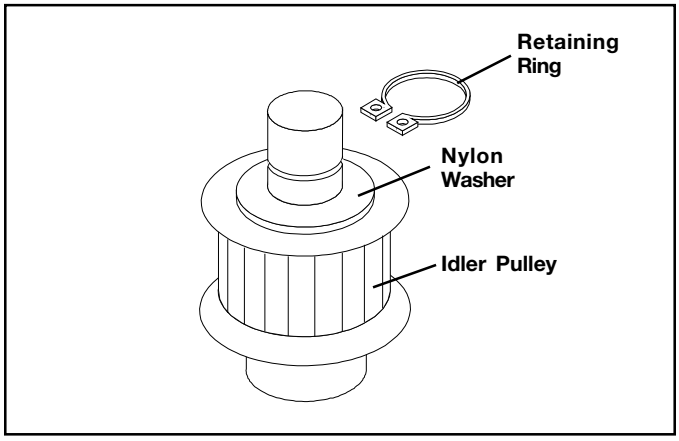


Fig. 3L

3. Slide the old pulley off; replace it with the new pulley (*Fig. 3L*).
4. Replace the retaining ring (*Fig. 3L*).
5. Replace the belt.
6. Set the belt tension as described in *Replacing the Belt* on page 3-3.

Replacing the Measurement Switch

To replace the measurement switch:

1. Remove the three screws that secure the rear panel (*Fig. 3A*), then lower the panel.

   CAUTION: PC boards contain static-sensitive parts. Always use appropriate ESD protection when the rear panel is open.

2. Disconnect the carriage ribbon cable from the connector board (*Fig. 3M*).
3. Remove the two screws securing the connector board to the lower carriage (*Fig. 3M*).
4. Remove the screw securing the wire clamp to the side of the lower carriage (*Fig. 3M*).
5. Remove the screws securing the measurement switch to the upper carriage (*Fig. 3M*), then remove the switch assembly.

   CAUTION: Take care not to strip threads when removing or replacing screws.

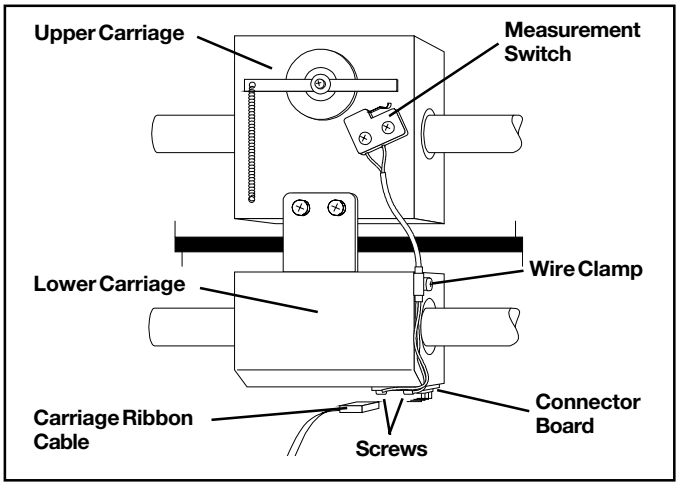


Fig. 3M

6. Install the new switch assembly by reversing steps 3–5.
7. Connect the carriage ribbon cable to the connector board.
8. Close the rear panel.

   NOTE: It may be necessary to bend the switch tang to ensure proper switch activation.

9. Calibrate the device (see *Calibration* on page 1-8).

Replacing the Home Position Switch

To replace the home position switch:

1. Remove the three screws that secure the rear panel (*Fig. 3A*), then lower the panel.

   CAUTION: PC boards contain static-sensitive parts. Always use appropriate ESD protection when the rear panel is open.

2. Remove the screws that secure the switch to the chassis (*Fig. 3N*).

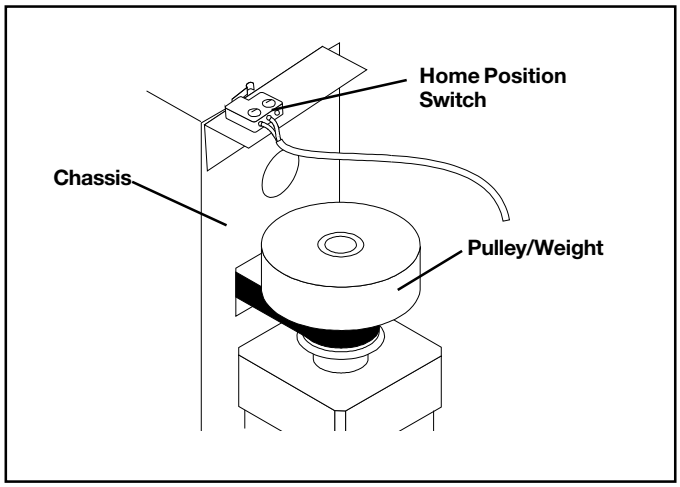


Fig. 3N

3. Disconnect the switch assembly wiring at the circuit board connector.
4. Install the new switch assembly, connecting it to the circuit board.
5. Adjust the switch so the carriage activates the switch before contacting the chassis.

   NOTE: It may be necessary to bend the switch tang to ensure proper switch activation.

6. Close the rear panel.
7. Calibrate the device (see *Calibration* on page 1-8).

Replacing the Pivot Assembly

To replace the pivot assembly:

1. Remove the measuring bar from the pivot assembly (*Fig. 3O*).
2. Remove the tray.
3. Remove the three 4-40 x .25" button-head allen screws located on the bottom of the pivot support plate (*Fig. 3O*).

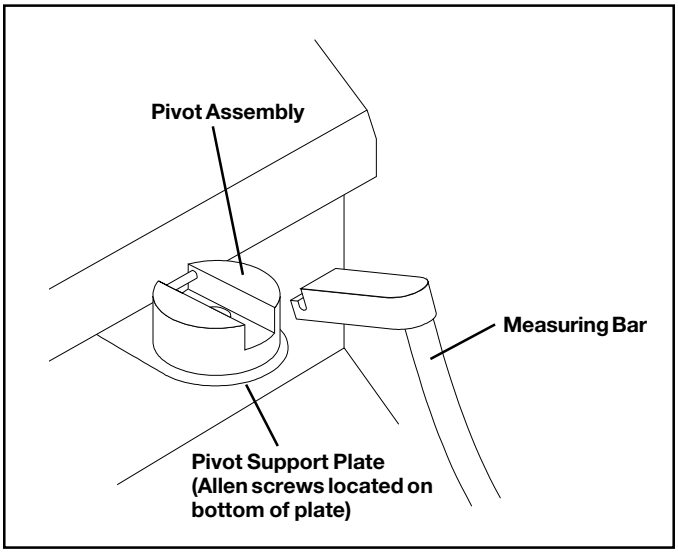


Fig. 3O

4. Remove the pivot assembly.
5. Adjust the new pivot assembly so the measuring bar is swiveled forward of its perpendicular position by 6 mm (*Fig. 3P*), then tighten the Allen screws.

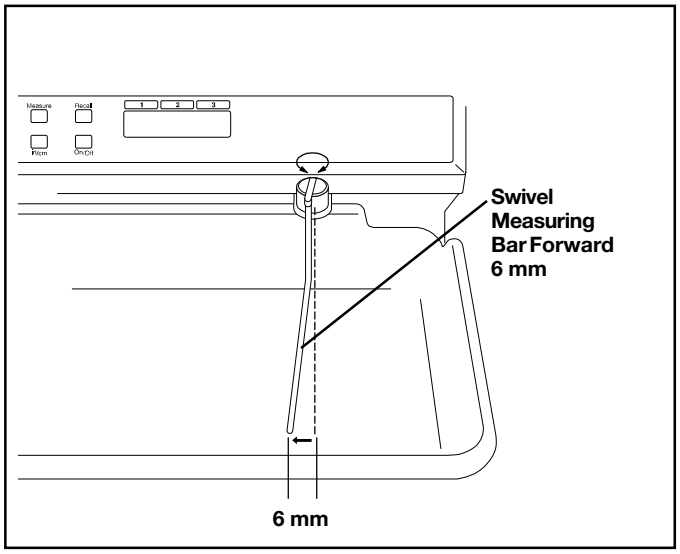


Fig. 3P

6. Install the tray and measuring bar.
7. Calibrate the device (see *Calibration* on page 1-8).

Measuring Bar Alignment

1. Remove the measuring bar (*Fig. 3O*).
2. Remove the tray.
3. Loosen the three 4-40 x .25" button-head Allen screws located on the bottom of the pivot support plate (*Fig. 3O*).
4. Adjust the pivot assembly so the measuring bar is swiveled forward of its perpendicular position by 6 mm (*Fig. 3P*), then tighten the Allen screws.
5. Install the tray and measuring bar.
6. Calibrate the device (see *Calibration* on page 1-8).

Electronic Repairs

Field service may be performed by a qualified technician to printed circuit board (PCB) level.

CAUTION: PCBs contain static-sensitive parts. Always use appropriate ESD protection when the rear panel is open.

Replacing the Power Supply PCB

To replace the power supply PCB:

1. Unplug power cord from the electrical outlet.
2. Disconnect connector from the battery pack (*Fig. 3Q*).
3. Disconnect connector to transformer/filter assembly (*Fig. 3Q*).
4. Disconnect connector to Main PCB (*Fig. 3Q*).

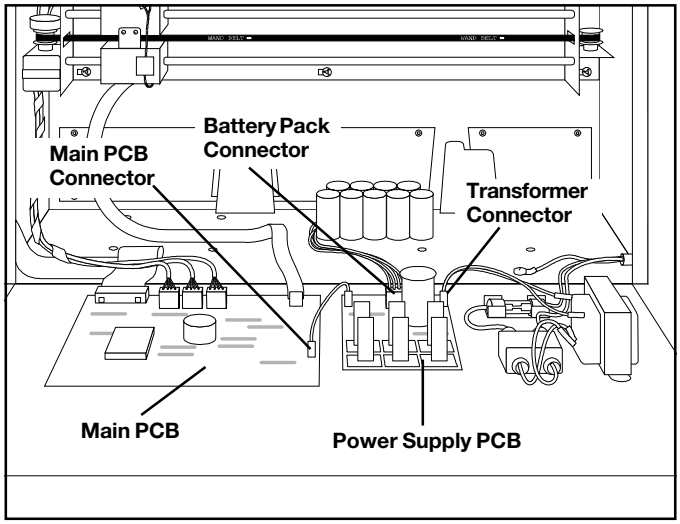


Fig. 3Q

5. Remove four nuts from the mounting studs.
6. Replace board by reversing steps 1–5.
7. Calibrate device (see *Calibration* on page 1-8).

Replacing the Main PCB

To replace the main PCB:

1. Unplug the power cord from the electrical outlet.
2. Disconnect the connector from the battery pack (*Fig. 3Q*).
3. Disconnect the connector from the Power Supply PCB (*Fig. 3R*).

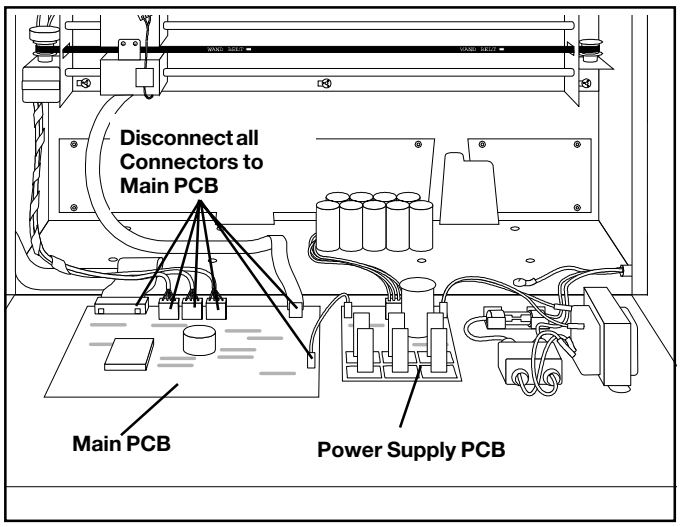


Fig. 3R

4. Disconnect the connectors from the display board, switches, motor, and optical encoder (*Fig. 3R*).
5. Remove the six nuts from the mounting studs.
6. Install the new board, then reassemble by reversing steps 1–5.
7. Calibrate the device (see *Calibration* on page 1-8).

Replacing the Display PCB

Required parts:

- Allen wrench

To replace the display PCB:

1. Unplug the power cord from the electrical outlet.
2. Disconnect the connector from the battery pack (*Fig. 3Q*).
3. Remove the three screws that secure the top cap assembly (*Fig. 3S*).

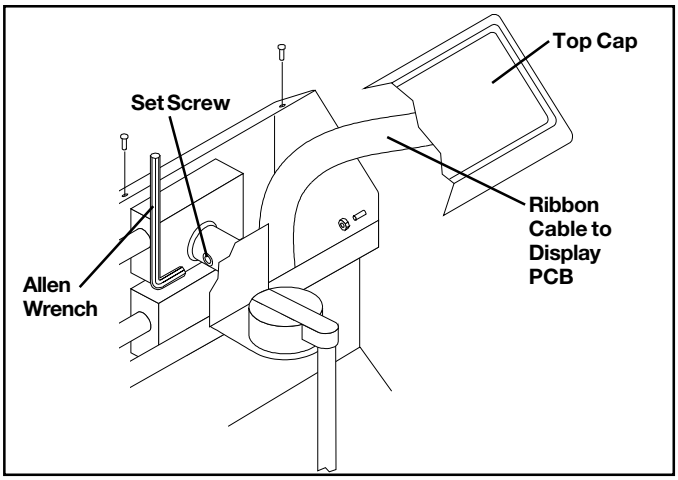


Fig. 3S

4. Loosen the two nuts on the inside ends of the top cap.
5. Rotate the top cap forward, pivoting on the ends of the mounting studs.
6. Lift the top cap slightly to gain access to the ribbon cable (*Fig. 3S*).
7. Disconnect the ribbon cable.
8. Remove the top cap assembly.
9. Remove the six nuts from the PCB mounting studs.
10. Install the new board by reversing steps 1–9.

    NOTE: Ensure that the ribbon cable is secure and that it does not interfere with travel of the bar assembly.

Repair Parts

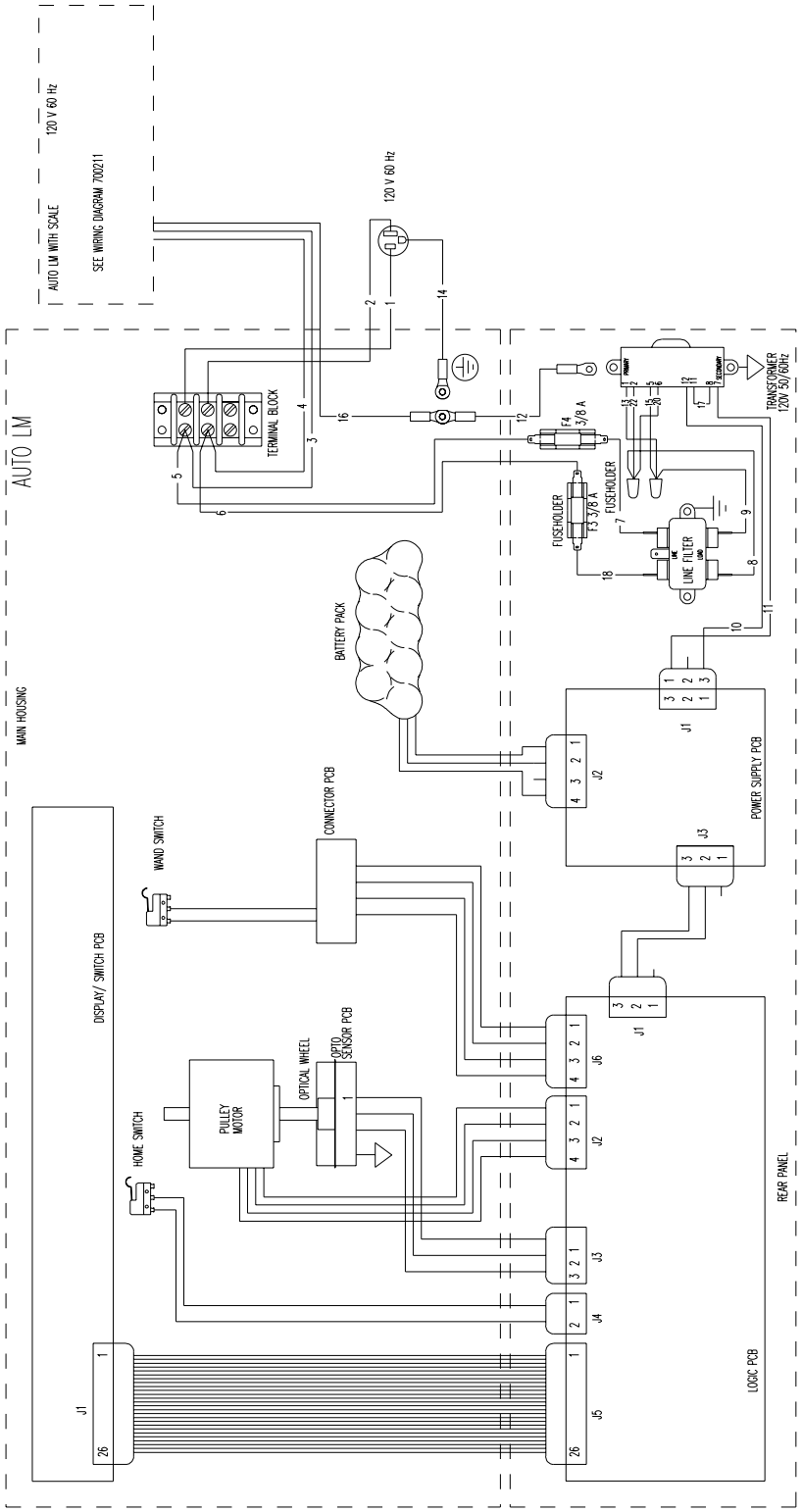
Part	Catalog No.
Battery Pack	400679-01
Fuse, 1/4 amp	200021-543
Fuse, 3/8 amp, Slo-Blo	200021-569
Fuse, 1-1/2 amp	200021-551
Power Supply PCB	400696
Logic PCB	400677
Display PCB with Display	400678
Measuring Bar	400704
Bar Pivot Assembly	400705
Belt	100346-01
Motor Pulley/Weight Assembly	400707
Idler Pulley	400708
Motor/Bracket Assembly	400710
Home Switch Assembly	400712
Measurement Switch Assembly	400698
Sensor PCB	400697
Encoder Wheel	400709
Upper Carriage Block with Bearings	400701
Lower Carriage Block with Bearings	400702
Carriage Shaft(s)	301336
Transformer	200254-501

Troubleshooting

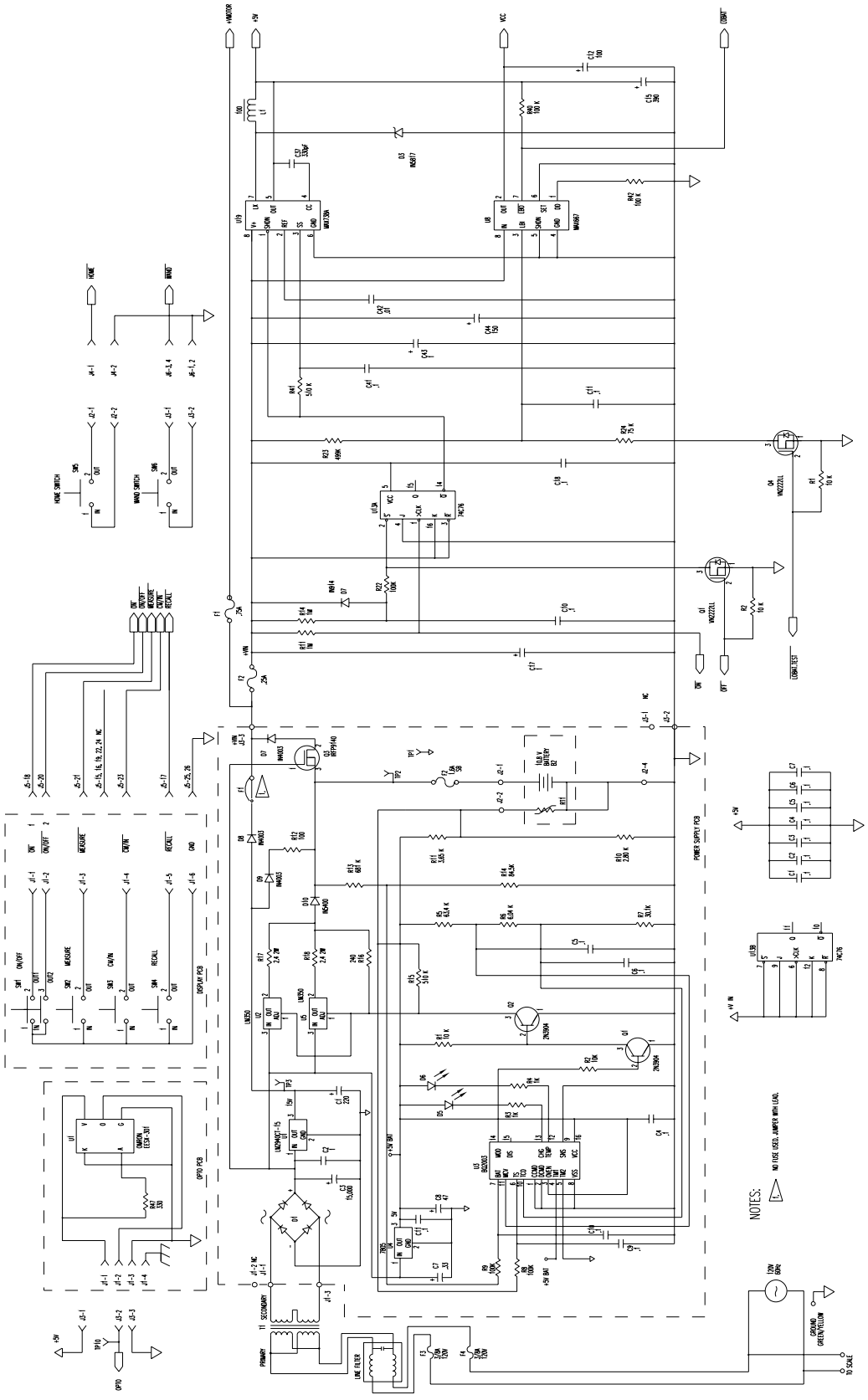
The following is a chart of possible problems, their probable causes, and solutions. For problems beyond the scope of this chart, call Olympic Medical toll free at 1-800-426-0353 in U.S. or Canada.

Problem	Probable Cause	Solution
Auto-Length does not turn on when ON/OFF is pressed	No AC power	Ensure that the power cord is plugged in.
		Check the external circuit breakers.
	No DC power	Ensure that the battery pack is fully charged.
	Internal 0.38-amp fuse blown	Replace the fuse (see page 3-2).
	PCB fuse blown	Contact Olympic Medical.
	Malfunctioning ON/OFF switch	Replace the Display PCB (see page 3-16).
"ERROR" message appears when measurement is attempted	Measuring Bar is blocked	Remove any obstructions (e.g., blanket) from the Measuring Bar path.
	Optical encoder is out of adjustment or failed	Replace or adjust the optical encoder (see page 3-6).
	Drive belt loose or broken	Adjust or replace the drive belt (see page 3-3).
	Motor failure	Replace the motor (see page 3-8).
"BAR JAMMED" message displays	Bar is being prevented from returning to neutral	Ensure that bar is not being pushed.
	Bar mechanism is jammed	Check the bar motion and adjust as needed.
	Measurement switch is malfunctioning	Replace the measurement switch (see page 3-10).
Bar continues to move forward after touching infant's foot	Measurement switch is malfunctioning	Replace the measurement switch (see page 3-10).
Bar does not move; no error displays	Drive belt broken or not engaged	Adjust or replace the drive belt (see page 3-3).
"READY" does not illuminate when Measuring Bar is fully retracted	Home switch out of adjustment or malfunctioning	Adjust or replace the home position switch (see page 3-11).
Batteries will not hold charge	Charger failure	Replace the power supply board (see page 3-14).
	Battery failure	Replace the battery pack (see page 3-1).
Incorrect measurement	Device out of calibration	Calibrate the device (see page 1-8).
	Measuring Bar not aligned	Adjust the bar alignment (see page 3-13).
		Check the belt tension (see page 3-3).

Auto-Length 120 Vac, 60 Hz
Wiring Diagram
Drawing No. 700215, Rev. B



Schematic
Drawing No. 700216
Sheet 1 of 2



Schematic
Drawing No. 700216
Sheet 2 of 2